1. The friction of the gaseous currents against the walls of the chambers and flues, which has not been considered in these computations, as sufficient data have not been available to establish the value of the coefficient.(1)

2. The effect of changes in the direction of flow.

In the computations made for ventilating ducts it is considered that a change in direction of 90° introduces a resistance equal to the velocity head, or that all of the velocity of the flowing gases will be lost or absorbed. If this is correct a change in direction of 180° may be considered as equivalent to two changes in direction of 90°, that is to say, it may be assumed that the resistance offered will be equal to twice the velocity head. A change in direction of 45° may be assumed as offering a resistance equivalent to 0.6 of the velocity head/2)

The following method is employed in approximating the resistance occasioned by changes in the velocity of the gases by reason of their passing from a larger to a smaller or a smaller to a larger flue or passage.

If a gas flows from a small channel into a larger channel or chamber there will be a change in velocity from Fmax to Ymin, and there will be no loss of head; but, when the gas passes from a larger channel into a smaller channel a sufficient velocity head will be required to impress upon the gas the increase in velocity required.

The computation of the resistance offered by the checkerwork of a regenerator is given below as an example. This checkerwork is composed of vertical channels, those in one tier being 120 mmX 60 mm and in the alternate tiers 60 mm X 60 mm.

The velocity of the gas in the smaller channels is" F_{max} and in the larger channels V_mm, so that

$$\text{mln}\frac{V\,\text{max}}{?)} \quad *$$

C1) This lack has recently been supplied, in part by W. A. Mojarow, in a

paper on the "Friction of gases in brickwork flues" in the *Rev. de la Societe russe de Metallurgie, 1913, No. 3, pp. 325-370; Revue de Metallurgie, XI bis, May, 1914, P> 820. Appendix IV.*

(2) Considerable data covering the flow of air may be found in, *Le Chauflage Industrielle by H. Le Chatelier, p. 47? & seq. D. Murgue "On the loss of head in Air Currents in Underground Workings. Trans. A.I.M.E., 1898, Vol. XXIII. Appendix V. (Notes et Formules p. 1090 et seq.)*